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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No. 10/583,079	Applicant(s) DEMACHI ET AL.
	Examiner Christopher Crutchfield	Art Unit 2466

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 01 December 2010.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 8,13-18,20-22,24-27 and 34-36 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) 24, 25 and 34 is/are allowed.
 6) Claim(s) 8,13-18,20-22,26,27,35 and 36 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. **Claim 21** objected to because of the following informalities: it depends from claim 13, which does not deal with encryption of transmissions, it appears the claim should depend from claim 20. Appropriate correction is required.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 8, 13-18, 20-22, 26, 27 and 35 are rejected under 35 U.S.C. 101 because, under the broadest reasonable interpretation, they are directed to software per se, which is not a process, machine manufacture or composition of matter and therefore does not constitute statutory subject matter.

In order to qualify as statutory subject matter, claimed subject matter must fall within one of the four statutory categories of 35 USC 101. *In re Nuijten*, 500 F3d 1346, 1354 84 USPQ2d 1495, 1500 (2007) ("Claimed subject matter must be within at least one of four categories enumerated in 35 U.S.C. §101 in order to be patentable, but once that requirement is satisfied, court need not be overly concerned about which of those categories claimed subject matter falls into; however, four categories in Section 101 together describe exclusive reach of patentable subject matter, and if claim covers material not found in any of those four categories, then claim

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falls outside plainly expressed scope of Section 101 even if subject matter is otherwise new and useful."). Software per se it is not a process, manufacture or composition of matter.

Furthermore, since it lacks any physical manifestation it cannot comprise a machine. See *Id at 1354*. See also *Ex Parte Cherian*, Appeal No. 2008-004157, BPAI, (Non-Precedential) (2009); *Ex Parte Magid*, Appeal No. 2008-003824, BPAI, (Non-Precedential) (2009).

Since the "communications control system" of claims 8, 13-18, 20-22, 26, 27 and 35 are embodied using a series of "sections" "configured to perform" specific functions, they may comprise pure software. That is, although some of the functions to be performed are such that they would require physical hardware to carry out, (For example, sending a path diagnosis packet) the system does not recite the actual use of the corresponding hardware, but merely recites that the system is configured to perform the function. Therefore, the system could comprise software that is configured to perform the respective functions on corresponding hardware when it is executed. Therefore, under the broadest reasonable interpretation the "communications control system" of claims 8, 13-18, 20-22 and 35 comprises software per se.

Finally, it is noted that the action has been made final, as the presented 101 rejection was not present in the previously objected/allowed claims, which stated that the particular sections actually carried out the corresponding functions as opposed to being "configured to" perform them and is therefore necessitated by amendment.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. **Claims 35 and 36** are rejected under 35 U.S.C. 103(a) as being unpatentable over *Chin*, et al. (US Patent No. 6,163,543) in view of The IEEE 802.3ad Standard (Author Unknown, IEEE 802.3ad Standard-2000, IEEE Press, March 2000, Pages 1-183), *Xu*, et al. (US Pre Grant Publication No. 2005/0002365), *Cristensen*, et al. (M. Christensen and F. Solensky, Considerations for IGMP and MLD Snooping Switches, Pages 1-25, October 2003) and *Chen*, et al. (J. Chen Z. Wang, Y. Sun, Real Time Capability Analysis for Switch Industrial Ethernet Traffic Priority-Based, Pages 525-529, 2002).

Regarding claims 35 and 36, *Chin* discloses a communication control system for controlling communications performed between a plurality of communication stations that are connected to communication paths being duplicated with a main path and a sub-path, the communication control system comprising and a communication control method for controlling communications performed between a plurality of communication stations that are connected to communication paths being duplicated with a main path and a sub-path, the communication control method comprising the steps of:

- a. A first communication function implementing sections which are duplicated so as to correspond with the main path and the sub-path respectively, and each of which is configured to implement a communication function in a physical layer of an OSI hierarchical model (Fig. 2, Element 224 and Column 3, Lines 40-51). (The system of *Chen* discloses the use of a link aggregation protocol for aggregating links from one or more servers [i.e. Communication Stations][Fig. 2, Element 228]. Each communication station has two physical links [i.e. first communication function implementing sections] to the adjacent switch via separate physical network interfaces [Fig. 2, Element 224 and Column 3, Lines 40-51]. The system operates by aggregating data to be transmitted at the data link layer by assigning a common data link layer [i.e. MAC] address to both of the physical links and transmitting data to the peer device using the assigned MAC address [Column 16, Lines 15-34 and Column 17, Line 47 to Column 18, Line 4]. The system may further implement sorting to separate packets to be transmitted into two prioritized groups [forming the high and low priority communication sections] [Column 17, Lines 16-36] and may then transmit the priority data over a first connection [i.e. the main path] until the main path fails, in which case both the high and low priority data are

transmitted over the second connection [i.e. the sub path] when the link collapses to using one path for both transmission [Column 11, Line 55 to Column 12, Line 2 and Column 17, Line 58 to Column 18, Line 4].)

- b. A second communication function implementing section which is configured to implement a communication function in a data link layer of the OSI hierarchical model (Column 16, Lines 15-34 and Column 17, Line 47 to Column 18, Line 4 - See (a), Supra).
- c. A high-priority communication section configured to perform a high-priority communication via the communication function implementing section and any one of the duplicated communication paths (Column 17, Lines 16-36 - See (a), Supra).
- d. A low-priority communication section configured to perform a low-priority communication via the communication function implementing section and the sub-path, the low-priority communication section being configured to transfer second data (Column 17, Lines 16-36 - See (a), Supra).
- e. Wherein the high-priority communication section and the low-priority communication section coexist in a single communication station, wherein the high-priority communication section is configured to perform the high-priority communication via the main path in a normal state, wherein the high-priority communication section is configured to perform the high-priority communication via the sub-path in abnormal state while the low-priority communication is restricted (Column 17, Lines 16-36). (The system

of *Chin* discloses a link aggregation system that allows a server to aggregate together outgoing links [Column 6, Lines 52-65]. *Chin* further discloses that the server may prioritize the outgoing data and may assign priority data to one of the paths and non-priority data to another of the sub-paths [Column 17, Lines 16-36]. Finally, *Chin* discloses that the two paths will collapse into a single path carrying both the priority and the non-priority data when the path heartbeat detects the priority path has failed, with the system giving preference to the priority data transmission [Column 11, Line 55 to Column 12, Line 2 and Column 17, Line 58 to Column 18, Line 4].)

f. Wherein the communication function implementing section includes an address storing section configured to store MAC addresses and a transmitting section configured to attach the corresponding MAC address to a communication frame (Column 16, Lines 15-34 and Column 17, Line 47 to Column 18, Line 4). (The system of *Chen* discloses that the link aggregation port is assigned a single multicast address which is stored by the data link layer protocol and is appended to all transmissions from the aggregated port [Column 16, Lines 15-34 and Column 17, Line 47 to Column 18, Line 4]).

Chin fails to disclose the use of two separate second communication implementing sections each connected with an associated first/physical layer communication function, such that the system further comprises second communication function implementing sections which are duplicated so as to correspond with the duplicated first communication function implementing sections respectively, and each of which is configured to implement a communication function in a data link layer of the OSI hierarchical model, a high-priority communication section configured to perform a high-priority communication via the first

communication function implementing section and the second communication function implementing section each corresponding to any one of the duplicated communication paths and a low-priority communication section configured to perform a low-priority communication via the first communication function implementing section and the second communication function implementing section each corresponding to the sub-path, the low- priority communication section being configured to transfer second data. In the same field of endeavor, The IEEE 802.3ad Standard discloses the use of two separate second communication implementing sections each connected with an associated first/physical layer communication function, such that the system further comprises second communication function implementing sections which are duplicated so as to correspond with the duplicated first communication function implementing sections respectively, and each of which is configured to implement a communication function in a data link layer of the OSI hierarchical model, a high-priority communication section configured to perform a high-priority communication via the first communication function implementing section and the second communication function implementing section each corresponding to any one of the duplicated communication paths and a low-priority communication section configured to perform a low-priority communication via the first communication function implementing section and the second communication function implementing section each corresponding to the sub-path, the low- priority communication section being configured to transfer second data (Page 97, Figure 43-2). (The system of The IEEE 802.3ad Standard discloses that a separate data link/MAC layer is present on each of the aggregated interfaces and is associated with a corresponding Physical Layer Interface [Page 97, Figure 43-2 - Everything below the "802.3 MAC Service Interface"].

Therefore, since The IEEE 802.3ad Standard suggests the use of separate data link layer interfaces for each physical layer interface, it would have been obvious to a person of

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ordinary skill in the art at the time of the invention to combine the separate data link layers of The IEEE 802.3ad Standard with the system of *Chin* by implementing two second communication functions, one for each physical layer device, as taught by The IEEE 802.3ad Standard and then linking the high and low priority communication section with each, as taught by *Chin*. The motive to combine is to allow for full data link layer redundancy by providing two data link layer communication functions.

Chin fails to disclose the second communication function implementing section includes an address storing section configured to store MAC addresses corresponding to the high-priority communication section and the low-priority communication section respectively, a transmitting section configured to attach the corresponding MAC address to a communication frame depending on whether a transmission requestor is the high-priority communication section or the low-priority communication section, and configured to transmits the communication frame to the communication path. In the same field of endeavor, *Xu* discloses the second communication function implementing section includes an address storing section configured to store MAC addresses corresponding to the high- priority communication section and the low-priority communication section respectively, a transmitting section configured to attach the corresponding MAC address to a communication frame depending on whether a transmission requestor is the high-priority communication section or the low-priority communication section, and configured to transmits the communication frame to the communication path.

Therefore, since *Xu* suggests transmitting video data using a multicast and storing and attaching separate MAC addresses for multicast and unicast data, and *Chin* suggests transmitting audio and video data at higher priority, it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the MAC based video multicasting of *Xu* with the prioritized audio and video of *Chin* by transmitting the audio and video using a

multicast address, as taught by *Xu*, via the high priority communication section of *Chin*, and recalling and attaching the appropriate multicast or unicast MAC address for the communication type, as taught by *Xu*. The motive to combine is to use link layer multicasting to transmit priority audio and video.

Chin fails to disclose a receiving section configured to compare a destination MAC address of the communication frame received from the first communication function implementing section with the MAC address stored in the address storing section, and when a match is found in the comparison result, configured to send the received communication frame to the corresponding communication section. In the same field of endeavor, *Cristensen* discloses a receiving section configured to compare a destination MAC address of the communication frame received from the first communication function implementing section with the MAC address stored in the address storing section, and when a match is found in the comparison result, configured to send the received communication frame to the corresponding communication section.

Therefore, since *Cristensen* discloses the separation of multicast traffic using a multicast destination MAC address that is distinct from a unicast destination address, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the multicast separation of *Cristensen* to separate out the high priority data of *Chin*, such as multimedia audio and video tagged with a destination multicast MAC address by using the destination multicast address to sort the multicast/high priority and unicast/low priority data at the receiving node. The motive to combine is to allow for the separation of multicast high priority data from low priority data.

Chin fails to disclose the high-priority communication section being configured to transfer first data in accordance with a protocol dedicated to process control and the low priority

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communication section being configured to transfer the second data in accordance with an open standard protocol, wherein the first data is more real time than the second data. In the same field of endeavor, *Chen* discloses the high-priority communication section being configured to transfer first data in accordance with a protocol dedicated to process control and the low priority communication section being configured to transfer the second data in accordance with an open standard protocol, wherein the first data is more real time than the second data (Pages 526-528, Sections II to IV). (The system of *Chen* discloses that high priority is used for process control traffic and that other traffic is transported using lower priority [Page 527, Section IV].

Therefore, since *Chen* suggests the use of high priority for transporting process control traffic and lower priorities for other traffic and *Robertson* as modified by *Chin* suggests that the other traffic may comprise traffic according to one of several "open" standards, it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the high priority process control traffic of *Chen* by assigning high priority to control traffic and low priority to all other traffic. The motive to combine is to allow rapid transmission of critical process control data.

Allowable Subject Matter

7. **Claims 24-25 and 34 are allowed.**
6. **Claims 8, 13-18, 20-22, 26 and 27 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 101, set forth in this Office action.**

8. The following is a statement of reasons for the indication of allowable subject matter

With regard to independent claim 8 and dependent claims 26 and 27 the prior art fails to disclose the use of a fixed cycle diagnosing section that utilizes separate multicast addresses for diagnosing a main and subpath between a station and which then transmits the results of a diagnosis and information contained in the received diagnostic packets of other stations in its own diagnostic packets where the main and sub-paths are used for respective high and low priority communications. For example, the closest prior art, *Robertson*, et al. only discloses the use of multicasting heartbeats two redundant paths, it does not disclose the use of separate multicast addresses on each of the paths, the use of high or low priority communication paths or the forwarding on of information received from other participating stations in the multicast heartbeats (See The Non-Final Rejection date 3 September 2010).

With regard to independent claim 13 and dependent claims 14, 21, 26 and 27 the prior art fails to disclose the use of a fixed cycle diagnosing section that utilizes separate IP multicast addresses for diagnosing a high priority main path connected via a high priority communications section and low priority subpath connected via a low priority communications section and in which all stations share the same IP multicast addresses for transmitting on the main and sub-paths and in which each station contains an active and a backup unit each containing a separate high priority and low priority section and diagnosing section, and which switches between the active and backup units when a communication fails via the active unit. For example, the closest prior art, *Chin* only discloses the use of a first and second paths used for high and low priority transmissions and fails to disclose the use of an active and backup unit in conjunction with two separate sets high and low priority paths. *Chin* also fails to disclose the use of multicast for detecting failed paths or the assignment of separate addresses to the active and backup units (See, for example, the rejection of claim 35, *supra*).

With regard to independent claim 15 and dependent claims 16, 26 and 27, the prior art fails to disclose the use of a fixed cycle diagnosing section that utilizes separate multicast addresses for diagnosing a main and subpath between a station and which then transmits the results of a failed path diagnosis of the main path to other stations on the main path or the use of the main and subpath for high and low priority transmissions. For example, the closest prior art, *Robertson*, et al. only discloses the use of multicasting heartbeats two redundant paths, it does not disclose the use of separate multicast addresses on each of the paths, the use of high or low priority communication paths or the multicasting of fault information of the main path on the failed main path (See, for example, the rejection of claim 35, *supra*).

With regard to independent claim 17 and dependent claims 26 and 27 the prior art fails to disclose a system with a high and low priority communications sections each storing a MAC address associated with the high and low priority communications section and attaching the MAC address to outgoing transmissions where the high priority communications section may be connected to a main path or a sub path and wherein the system holds a multicast address storing section that stores a plurality of MAC multicast addresses which it checks against incoming transmission to determine if the transmission is to be sent to the high priority or low priority communications section and which, when the main path is faulty, the low priority communications section controls its transmission rate to be smaller then a predetermined value.

With regard to independent claim 18 and dependent claims 26 and 27 the prior art fails to disclose a communications system with a high and low priority communications section and a path diagnosing section that uses different IP multicast addresses to diagnose a main and a subpath and which records the results of the cyclic diagnosis of the path state on the main and sub path from the communications station to each other communications station and which, based on the diagnosis result switches the high priority communications to the sub-path and

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suspends transmission of low priority information while high priority information is being transmitted. For example, the closest prior art, *Robertson*, et al. only discloses the use of multicasting heartbeats two redundant paths, it does not disclose the use of separate multicast addresses on each of the paths, the use of high or low priority communication paths, the storing and checking of the availability of the path between the transmitting station and multiple receiving stations, or the pre-emption of low priority traffic after a failover on the main path (See, for example, the rejection of claim 35, supra).

With regard to independent claim 20 and dependent claims 22, 26 and 27 the prior art fails to disclose the use of high and low priority paths with fixed cycle diagnosis and storage, as discussed in claim 18, supra. The prior art also further fails to disclose the use of a public and private key to authenticate the transmissions between the stations.

With regard to independent claims 24 and dependent claims 25, 26 and 27 the prior art fails to disclose the use and storage of separate addresses for identifying high priority transmissions from other stations, as discussed with respect to claim 17, supra. It further fails to disclose the use of a master station for storing and forwarding diagnostic information from other communication stations not on the same sub-network.

With regard to independent claim 34 and dependent claims 25, 26 and 27 the prior art fails to disclose the use of a high and low priority path with a cyclic diagnostic section for diagnosing the main and sub-paths, as discussed with respect to claim 8, supra. The prior art further fails to disclose the use of a master station for storing and forwarding diagnostic information from other communication stations not on the same sub-network.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Crutchfield whose telephone number is (571) 270-3989. The examiner can normally be reached on Monday through Friday 8:00 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Ryman can be reached on (571) 272-3152. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher Crutchfield/
Examiner, Art Unit 2466
2/9/2011

/Daniel J. Ryman/
Supervisory Patent Examiner, Art Unit 2466